**Course Specification**

**(PH 111: Physics)**

|  |  |
| --- | --- |
| **University:** | Helwan University |
| **Faculty:** | Faculty of Computers & Information |
| **Department:** | Computer science |

**1. Course Data**

|  |  |
| --- | --- |
| **Code:** | PH 111 |
| **Course title:** | Physics |
| **Level:** | 1 |
| **Specialization:** | General |
| **Credit hours:** | 3 hours |
| **Number of learning units (hours):** | (3) theoretical (2) tutorial |

**2. Course Objective**

This course aims to provide first year's students with the required basics and fundamentals of Physics to provide students with a clear, logical presentation of the basic concepts and principals of physics through a broad range of interesting applications.

**3. Intended Learning Outcomes:**

1. **Knowledge and Understanding**

A1. Apply the basics of Physics.

1. **Intellectual Skills**

B3. Develop Analytical skills.

B8. Gather and assess relevant information, using abstract ideas to interpret it effectively.

1. **Professional and Practical Skills**
2. **General and Transferable Skills**

D9. Follow Logical Thinking in real time problem solving. (IS)

**4. Course contents**

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **No. of hours** | **Lecture** | **Tutorial/ Practical** |
| **Electricity** |  |  |  |
| Electrostatic charge    -Charge and matter    -Conservation of charge    -Coulomb law | 3 | 1 | 1 |
| Electrostatic field    -Electric field and electric force    -Electric charge in electric field    -Electric dipole electric field | 3 | 1 | 1 |
| Gauss Law    -Electric flux    -Gauss’s law    -Application of Gauss law | 3 | 1 | 1 |
| Electric Potential    -Work    -Potential | 3 | 1 | 1 |
| Capacitance    -Capacitor    -Capacitance    -Electric field energy    -Dielectric | 6 | 2 | 2 |
| **Optics** |  |  |  |
| The nature of light    -Newton's practical theory    -Huygens wave theory    -Spherical waves    -Plain waves | 6 | 2 | 2 |
| Reflection of light    -Plain Surface    -Diversion of light    -Diversion by successive reflections | 6 | 2 | 2 |
| Reflection at curved surface    -Concave mirrors    -Convex mirrors | 3 | 1 | 1 |
| Refraction at plain surface    -Snell's law    -Refraction through curved surface | 3 | 1 | 1 |
| Thin lens    -Thin lens formula | 3 | 1 | 1 |

**Mapping contents to ILOs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Topic | Intended Learning Outcomes (ILOs) | | | |
| Knowledge and understanding | Intellectual Skills | Professional and practical skills | General and Transferable skills |
| **Electricity** | A1 |  |  |  |
| Electrostatic charge | A1 |  |  |  |
| Electrostatic field | A1, A28 |  |  |  |
| Gauss Law | A1 |  |  |  |
| Electric Potential | A1 |  |  |  |
| Capacitance | A1, A28 |  | C7, C13 | D9 |
| **Optics** | A1 |  |  |  |
| The nature of light | A1 |  |  |  |
| Reflection of light | A1 |  |  |  |
| Reflection at curved | A1 | B3, B8, B8. B20 |  | D13 |
| Refraction at plain | A1 |  |  |  |
| Thin lens | A1 |  |  |  |

**5. Teaching and Learning Methods**

**4.1-** Class Lectures

**4.2-** Highly lab-based courses

**6. Teaching and Learning Methods for students with limited capability**

Using data show

e-learning management tools

**7. Students Evaluation**

**a) Used Methods**

5.1- Lab exam

5.2- Assignments

5.3- Lab work

5.4- Written exams

**b) Time**

Assessment 1: Test1 Week 4

Assessment 2: Test 2 Week 7

Assessment 3: Midterm exam Week 10

Assessment 4: Project Week 14

Assessment 5: final written exam Week 16

**c) Grades Distribution**

Mid-term Examination 15 %

Final-Year Examination 50 %

Semester Work 15 %

Project 20%

Total 100%

Any formative only assessments

**List of Books and References**

**a) Notes**

Course Notes

- Handouts

**b) Mandatory Books**

**Title:**

**Author(s):**

**Publisher:**

**ISBN:**

**c) Suggested Books**

**d) Other publications**